THURSDAY, AUGUST 14, 1919.

PHOTOGRAPHY.

Photography: Its Principles and Applications. By Alfred Watkins. Second edition revised. Pp. xvi + 333. (London: Constable and Co., Ltd., 1918.) Price 10*s*. 6*d*. net.

THE Watkins exposure meter is known wherever photography is practised, and the many other instruments that Mr. Watkins has introduced to render photography less haphazard than it so often is enjoy a wide appreciation. The author therefore comes to the task of writing a general treatise with what we may perhaps call a praiseworthy prejudice. Of this he is doubtless aware, for he says in his preface: "The greater attention given to my own methods in exposure and development will, I am sure, be forgiven." The author makes these methods clear and illustrates them well, and proves the error of certain notions that have been put forward from time to time, as, for example, that one should regulate the exposure of the plate according to the light that comes from the object rather than that which falls upon it.

As a practical guide for the ordinary photography of the amateur and the professional portrait photographer, the volume deserves commendation, although some important subjects are treated of with an unsatisfying conciseness. But when the author gets to matters of which he has presumably not made a special study, his statements are not so trustworthy. The confusion of "focus" and "focal length" has had such distinguished and prolonged patronage that perhaps we ought to pass it by; still, it is confusion, and it is avoidable. Mr. Warnerke is referred to as "Warneke," and Sir Joseph Wilson Swan, who died five years ago, as "Mr. J. W. Swan (now Sir John Swan)." With regard to Woodburytype, we are told that "a lead mould is made of a carbon print swollen in water so that the exposed parts are raised," and that "in the Woodburytype process the mould was taken by placing a polished sheet of lead on the wet carbon print and bringing both under heavy pressure in a hydraulic press." The gelatine relief was, of course, well dried before being caused to impress the lead. We have said enough to indicate that some parts of the book are much in need of revision.

The scope of the volume, as indicated by the table of contents, is very wide. We find stereoscopic work, panoramic photographs, enamels, ferrotypes, night photography, animated photography, "bioscope in colour," photo-telegraphy, photo-surveying by balloons, kites, and aeroplanes, telephotography, photomicrography, X-ray photography, astronomical photography, "spectrophotography," photo-mechanical processes, colour photography, etc., and each has at least an indication of its most obvious characteristics.

As the results of every method of sensitometry depend upon circumstances, and there can never be a standard method in a scientific sense, but only by agreement for the sake of convenience, all methods are of value, and we are glad to see that Mr. Watkins has again brought forward his "central speed" method.

C. J.

A RECORD OF SCIENTIFIC PROGRESS.

British Science Guild: British Scientific Products Exhibition, Central Hall, Westminster, July 3 to August 5, 1919. Descriptive Catalogue. Edited by Sir Richard Gregory. Pp. xxiii + 358. (London: British Science Guild, 1919.) Price 2*s*. 6*d*. net.

MERELY to enumerate the contents of this interesting volume would occupy more space than could be reasonably allotted to an ordinary review. But this catalogue is something more than a list of exhibits, even admitting that there is much instruction to be derived from the descriptions associated with the objects shown.

The catalogue contains, first, an introduction by Sir Richard Gregory, chairman of the organising committee, and, if read attentively, as it ought to be, especially by employers and manufacturers, cannot fail to have a stimulating effect. The list of exhibits shows that in many directions this country has regained control of important raw materials, and by the application of scientific knowledge and technical experience has achieved results of which, as Sir Richard says, "the nation has every reason to be proud. Now is the time to see that the strong position thus gained is not lost, and to unite the interests of the people of these islands with those of British lands beyond the seas."

The volume before us sets out the sources from which new experimental results have proceeded during the war, and in the first place shows the extent of the debt incurred to the scientific authorities of the universities and technical colleges throughout the kingdom. In despatches at the end of 1916 warm acknowledgment of the help thus given is expressed by Sir Douglas Haig, and in 1919, again, by General Sir Henry Wilson, Chief of the Imperial General Staff. But in the past manufacturers have been slow to make use of the results secured by research in the scientific laboratory, and it is, therefore, all the more satisfactory to find that during the last five years very many of them have recognised the necessity of using scientific knowledge and employing scientifically trained men in their works to a much greater extent than heretofore. The result is that many industries are now associated directly with research either in the separate factories or by a co-operative arrangement through the medium of research associations. To manufacturers, whether or not they are contemplating this question with a view to their own requirements, the facts and figures provided in the article on "The Organisation of Scientific Research in Works," by Mr. A. P. M. Fleming

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(p. 77), will be found worthy of careful consideration.

To those who have been so long hoping that some day the importance of science in connection with industry would be recognised by the State, the Government scheme for industrial research is a source of satisfaction. The department now established has made a good beginning in affording assistance to many workers from the fund of one million granted by the Government and in encouraging the formation of research associations among manufacturers. Many of these are already in operation and are enumerated, with the names of their officers, in the comprehensive volume under notice.

THE BIRDS OF COLOMBIA.

Bulletin of the American Museum of Natural History. Vol. xxxvi., 1917. *The Distribution of Bird-Life in Colombia: A Contribution to a Biological Survey of South America.* By Dr. Frank M. Chapman. Pp. x+729+xli plates. (New York: The American Museum of Natural History, 1917.)

DR. CHAPMAN'S "Report on the Distribution of Bird-Life in Colombia" ranks amongst the most important contributions ever made to the knowledge of the ornis of the Neotropical Region, the avifauna of which stands unrivalled both in the wealth and variety of its feathered forms and in the number of its peculiar family and generic types. Colombia, thanks to Dr. Chapman's investigations, is now known to be the richest portion of this remarkable area so far as bird-life is concerned. That this should be so is due, no doubt, to the varied physiographical features to be found in that equatorial republic, for these range from tropical pasture-lands and forests at low, or comparatively low, levels to regions of perpetual snow in the Cordilleras, and include the uppermost tributaries of the Orinoco and some of those of the Amazon.

In the year 1910 the American Museum of Natural History organised and commenced a series of expeditions for the systematic exploration of the bird-life of the republic. These extended over five years, and were carried out under the direction of Dr. Chapman, who himself took part in them in 1910 and again in 1913. As the result of these systematic and well-organised explorations, 15,775 specimens, representing 1285 forms (species and subspecies), were obtained. Hence the report is based not only upon scientifically collected data, but also upon intimate personal knowledge of the country and its birds on the part of its author—a combination which has rendered the work of inestimable value.

As the result of his studies on this ideal system, Dr. Chapman recognises the following vertical life-zones: A tropical, which ranges up to 4500–6000 ft.; a sub-tropical, from 4500–6000 ft. to 9000–9500 ft.; a temperate, from 9000–9500 ft. to 11,000–13,000 ft.; a paramo (high plateau), from 11,000–13,000 ft. to the snow-line at 15,000 ft. These zones he again subdivides into faunal areas, so that the distribution of bird-life in Colombia is worked in remarkable detail. The author tells us that the uniformity of life increases with altitude, and that the distinctness of the various animals and plants of these several zones was a constant source of surprise and joy to him.

It is quite impossible here to enter into details of the various distributional problems unfolded by the author, but the portions of the work devoted to them are the most interesting and valuable to be found in this great work.

The systematic portion of the report treats in detail of the distribution, plumage, haunts, habits, etc., of the 1285 forms of bird-life which constitute the ornis of Colombia. Of these, twenty-two species and 115 subspecies are new to science. It is much to be regretted that Dr. Chapman has not included in his report the birds, some 400 in number, which had previously been recorded, but did not come under the notice of himself or his explorers. If this had been done it would have rendered his volume a complete record of all that is known to date of the avifauna of Colombia.

The volume is enriched by a series of reproductions of photographs of scenery depicting the various life-zones, and of useful maps and charts illustrating the distribution of species, forests, etc. It is further embellished by four coloured plates, devoted to the newly discovered birds, by the well-known zoological artist, Louis Agassiz Fuertes, who accompanied Dr. Chapman on two of his expeditions.

The author is to be heartily congratulated on the completion of his admirable work and on the masterly manner in which he has presented its results. Congratulations are also due to that enlightened institution, the American Museum of Natural History, which made this grand undertaking possible.

W. E. C.

OUR BOOKSHELF.

Practical Physiological Chemistry. A Book Designed for Use in Courses in Practical Physiological Chemistry in Schools of Medicine and of Science. By Prof. Philip B. Hawk. Sixth edition, revised and enlarged. Pp. xiv+661+vi plates. (London: J. and A. Churchill, 1919.) Price 21*s.* net.

THIS book, written by one of the best known of American physiological chemists, first appeared in 1907. Its success is evident from the fact that it is now in its sixth edition, and is due to the clearness and completeness of the practical instructions with which it is packed. It does not pretend to be a complete work of reference, but, though designed for the use of students, it is far too exhaustive for the ordinary student of medicine, who in the few years of his curriculum has to learn so many other subjects, and it is difficult to imagine that the American student can devote

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